

Att'y Ref. No. 003-099

U.S. App. No.: 10/725,564**REMARKS**

Favorable reconsideration, reexamination, and allowance of the present patent application are respectfully requested in view of the foregoing amendments and the following remarks.

Rejection under 35 U.S.C. § 112, second paragraph

In the Office Action, beginning at page 2, Claims 1-7 were rejected under 35 U.S.C. § 112, second paragraph, as reciting subject matters that allegedly are indefinite. Applicant respectfully requests reconsideration of this rejection.

The Office Action alleges that the change in the claims' terms from "and/or" to an ordered list ending in "or both" renders the scopes of the claims indefinite. Applicant respectfully disagrees. Standard English grammar still applies to U.S. patent claim language, as unusual as it may be; this is recognized by M.P.E.P. § 2173.05(h), "Alternative Limitations". The M.P.E.P. not only specifically sanctions the use of "or" in an ordered list, but presents the examples of "wherein R is A, B, C, or D" and "iron, steel or any other magnetic material". Drawing analogy to the terms of the claims pending in this application, "D" (in the M.P.E.P.'s first example) is merely the combination of other elements in the list, *i.e.*, 'both'. Applicant respectfully submits that the PTO's policy, as reflected in the M.P.E.P., is that lists such as those recited in the pending claims are not *per se* indefinite, and furthermore that one of ordinary skill in the art would find the claims' scopes perfectly clear.

For at least the foregoing reasons, Applicant respectfully submits that Claims 1-7 fully comply with 35 U.S.C. § 112, second paragraph, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 112.

Rejection under 35 U.S.C. § 102

In the Office Action, beginning at page 3, Claims 1-3, 7, and 8 were rejected under 35 U.S.C. § 102, as reciting subject matters that allegedly are anticipated by U.S. Patent No. 6,464,489, issued to Gutmark et al. ("Gutmark"). Applicant respectfully requests reconsideration of this rejection.

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Applicant first notes that *Gutmark* was invented by the inventors herein, and thus Applicant has an intimate understanding of its disclosure.

This application describes embodiments of methods and systems exemplifying principles of the present invention useful for addressing thermoacoustic oscillations in combustion systems. One aspect of the present invention includes the general idea of separately affecting a plurality of interference frequencies of the thermoacoustic oscillations. In this way, detrimental interactions which, when combating one interference frequency, can cause amplification of the another interference frequency, can be reduced or eliminated. It has been shown that, by means of the procedure according to the invention, at least damping of the main interference frequency can be boosted considerably.

Claim 1 relates to a method for affecting thermoacoustic oscillations in a combustion system including coordinating the acoustic excitations of the gas flow, the modulated injections of the fuel, or both, to simultaneously affect at least two different interference frequencies of the thermoacoustic oscillations.

Claim 7 relates to a device for affecting thermoacoustic oscillations in a combustion system having combination of elements including, *inter alia*, a control system driving an at least one acoustic source, an at least one control valve, or both, to simultaneously affect at least two different interference frequencies of the thermoacoustic oscillations.

The prior art, including *Gutmark*, fails to identically disclose or describe the subject matters of the pending claims.

Gutmark discloses a method and a device each adapted for affecting thermoacoustic oscillations by means of acoustic excitations. According to the passage cited in the Office Action, column 5, lines 22 to 63, the method/device of *Gutmark* is in principle adapted for adapting the acoustic excitation to the current interference frequency of the thermoacoustic oscillations. That interference frequency can change during operation of the burner, and the acoustic excitation can be adapted to this change of the interference frequency. This application of changing the frequencies is only related to tracking the acoustic excitation to the current interference frequency, and is not related to simultaneous acoustic excitations of at least two

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different frequencies. Accordingly, *Gutmark* teaches performing acoustic excitation always at a single frequency. While this single frequency can be changed, it is always only a single frequency being affected by the acoustic excitation. Thus, *Gutmark* fails to identically disclose or describe each and every element or step recited in the combinations of the pending claims.

For at least the foregoing reasons, Applicant respectfully submits that the subject matters of Claims 1-3, 7, and 8 are not anticipated by *Gutmark*, are therefore not unpatentable under 35 U.S.C. § 102, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 102.

Rejection under 35 U.S.C. § 103(a)

In the Office Action, beginning at page 4, Claims 4-6 were rejected under 35 U.S.C. § 103(a), as reciting subject matters that allegedly are obvious, and therefore allegedly unpatentable, over *Gutmark* in view of the disclosure of U.S. Published Patent Application No. 2001/0027638, invented by Paschereit *et al.* ("Paschereit"). Applicant respectfully requests reconsideration of this rejection.

Applicant again notes that the present inventors are inventors named in *Paschereit*, and therefore also have an intimate understanding of its teachings. In summary, neither *Gutmark* nor *Paschereit* discloses, describes, or suggests simultaneously affecting at least two different interference frequencies, as recited in the combinations of the pending claims.

Assuming, *arguendo*, that one of ordinary skill in the art would somehow find motivation to combine the disclosures of *Gutmark* and *Paschereit* in the manner alleged to be obvious in the Office Action, the resulting hypothetical constructs and methods would still not include each and every element or step recited in the pending claims, at least because neither discloses or suggests simultaneously affecting at least two different interference frequencies. Instead, a combination of *Gutmark* and *Paschereit* could only lead, at best, to a method/device adapted for affecting thermoacoustic oscillations by means of acoustic excitations and by fuel modulation at the respective interference frequency to be damped. There is no suggestion of simultaneously affecting at least two different interference frequencies.

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One of ordinary skill in the art would find no motivation to combine the disclosures of *Gutmark* and *Paschereit* to arrive at the presently claimed invention. Instead, the claimed combinations could only be arrived at through an impermissible hindsight reconstruction of the claimed combinations by reference to the Applicant's own specification.

The person skilled in the art is often confronted with the problem of reducing or damping thermoacoustic oscillations. In the state of the art, the skilled person will find *Gutmark* and *Paschereit*, each disclosing a state of the art solution to that problem. The skilled person will recognize, upon a full and fair reading thereof, that the solutions of *Gutmark* and *Paschereit* are equivalent, yet alternative solutions to the problem; the skilled artisan would choose one or the other to solve his problem. The skilled artisan will not find motivation to combine their teachings.

In *Gutmark*, at column 3, lines 22 to 31, the skilled person will find *Gutmark*'s comment that modulation of the equivalence ratio, *i.e.*, the fuel/oxidizer-ratio, is with respect to acoustic excitation an alternative way of damping thermoacoustic oscillations, but an alternative way which is ineffective with respect to the acoustic excitation taught by *Gutmark*. The Office Action's positions therefore demand the question: why should the skilled artisan combine the effective acoustic excitation of *Gutmark* with the less effective modulation of the equivalence ratio? *Gutmark* thus teaches away from a general combination of *Gutmark* and *Paschereit*, because the person of ordinary skill in the art would not expect to improve the "good" method with the "bad" method, as *Gutmark*'s disclosure characterizes them. Furthermore, modulation of the equivalence ratio, referred to in *Gutmark*, is not the same as the fuel modulation.

Additionally, *Gutmark*'s solution to the general problem involves other problems (*e.g.*, mounting and controlling of acoustic generators) when attempting to realize acoustic excitation. Realization of the fuel modulation approach according to *Paschereit* is associated with yet further problems (*e.g.*, mounting and controlling of fuel control valves). The skilled person thus is faced with, on the one hand, all the various realization problems and recognizes, on the other hand, that the solution according to *Paschereit* will be less effective than the solution according to *Gutmark* (discussed above). The skilled artisan would therefore be motivated away from any

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combination of *Gutmark* and *Paschereit*, because there is no economically interesting solution in combining the two alternatives.

For at least the foregoing reasons, Applicant respectfully submits that the subject matters of Claims 4-6, each taken as a whole, would not have been obvious to one of ordinary skill in the art at the time of Applicant's invention, are therefore not unpatentable under 35 U.S.C. § 103(a), and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 103(a).

Conclusion

Applicant respectfully submits that the present patent application is in condition for allowance. An early indication of the allowability of this patent application is therefore respectfully solicited.

If Mr. Cocks examiner believes that a telephone conference with the undersigned would expedite passage of this patent application to issue, he is invited to call on the number below.

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It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. If, however, additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and the Commissioner is hereby authorized to charge fees necessitated by this paper, and to credit all refunds and overpayments, to our Deposit Account 50-2821.

Respectfully submitted,

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